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Basic Data for the 1982 Canadian Salmonid Catch Sampling and Mark Recovery Program Handbook

Catch, Sample Size, Observed and Estimated Mark Recoveries for 18 Catch Regions

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CANADIAN DATA REPORT OF
FISHERIES AND AQUATIC SCIENCES 454

May 1984

BASIC DATA FOR THE 1982 CANADIAN SALMONID CATCH SAMPLING AND MARK RECOVERY PROGRAM

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Catch, Sample size, Observed and Estimated
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by

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ABSTRACT

The Canadian Mark Recovery Program was initiated in 1974 to provide observed and estimated recoveries of adipose fin-clipped, coded-wire tagged chinook salmon (Oncorhynchus tshawytscha), coho salmon (O. Kisutch),and steelhead trout (Salmo gairdneri) in various British Columbia commercial and sport fisheries. In 1980, sampling was expanded to include recoveries of marked chum salmon (O. keta).

This report consists of five parts. Part One presents catch size, sample size, and observed and estimated recoveries for 18 British Columbia Catch Regions. Observed and estimated mark recoveries for each tag code are presented in Part Two. Parts three and Four present the data associated with individual chinook, coho, steelhead, and chum recoveries. Part Five presents a summary of recovered tag codes for the various hatcheries and wild tagging streams.

Key Words:

ocean fisheries, British Columbia, mark sampling, adipose fin-clips, coded-wire tags, chinook salmon, coho salmon, steelhead trout, chum salmon

RESUME

Le programme canadien de récupération des étiquettes a été mis sur pied en 1974 dans le but de générer des estimations et des observations sur des récupérations d'étiquettes de saumon quinnat (Oncorhynchus tsahawytscha), saumon coho (O. kisutch) et de truite arc-en-ciel anadome (Salmo gairdneri), dans les diverses pêcheries sportives et commerciales en Columbia-Britannique. Pour les besoins du programme, les salmonidés identifiés sont ceux dont la nageoire adipeuse est rognée et ces poissons possèdent une étiquette métallique codée. En 1980, on a élargi l'échantillonnage afin d'inclure les récupérations de saumon kéta (O. keta) marques.

Le rapport présent est constitué de cinq parties. La première porte sur la taille de la prise, la taille de l'échantillon et les récupérations estimées et observées pour 18 regions de capture de la Columbia-Britannique. Dans la deuxième partie, on retrouvera les récupérations estimées et observées de marques selon chaque code d'étiquette. Les trousième et quatrième parties présentent les données sur les récupérations individuelles de saumons quinnat, coho et kéta et de truite anadrome. La dernière partie offre un résumé des codes d'étiquettes en fonction des diverses piscifactures et des ruisseaux sauvages ou l'étiquetage a eu lieu.

Mots cles:

pêches océaniques, Colombia-Britannique, échantillonnage des marques, rognage de la nageoire adipeuse, étiquettes métalliques codées, saumon quinnat, saumon coho, truite arc-en-ciel anadrome, saumon kéta

INTRODUCTION

Due to growing concern over the decline of salmonid stocks, a joint U.S./Canada committee, the International Informal Committee on Chinook and Coho, was formed in the late 1960's to try and produce a management plan for chinook and coho. The principal of mark recovery was adopted as a research tool in an effort to collect data on movement, timing, and survival of the ocean-going salmonids.

First efforts to mark large numbers of salmonids were conducted by U.S. fisheries agencies on salmon from Columbia River and Puget Sound hatcheries. The fish were marked as juveniles by clipping various combinations of fins, not necessarily in combination with the adipose fin. Marked fish were recovered by sampling catches and by reporting of marked fish by fishermen. However, fin marking has limitations. The removal of certain fins increases the mortality rate significantly, and the number of usable combinations is limited. Regeneration of clipped fins, naturally missing fins, and naturally damaged fins results in mis-identifications. External tags were used successfully on adult salmonids but their use on juveniles increased mortalities and tag loss.

The development of the Bergman-Jefferts coded-wire tag (CWT) revolutionized tagging programs. The 1 mm long, microscopic tag is implanted in the nose cartilage of juvenile salmonids and does not interfere with swimming behavior. Since the CWT is an internal tag, an external identifying mark is required. The adipose-only fin clip was chosen because its removal has the least effect on swimming behavior.

In 1970, through the International Informal Committee on Chinook and Coho, the United States requested Canadian participation on a tag and fin mark recovery study carried out by the Washington Department of Fisheries. The study was designed to evaluate the production and contribution to coastal fisheries of Puget Sound and Columbia River hatcheries. Canada agreed to take part and requested the program be expanded to include Canadian hatchery chinook and coho.

Funding for the Canadian recovery program came through in April 1973 and a system for voluntary returns of commercial and sport caught fish in the Strait of Georgia was initiated. In February 1974 approval and funds were received for a coastwide Canadian Salmonid Catch Sampling and Mark Recovery Program. The expanded program included direct sampling of commercial catches for marks, aiming for an optimum 20% sampling rate, the continuation of the voluntary sport recovery system, and the addition of sport and commercial logbook programs. The Mark Recovery Program has since retained this basic design.

In 1982, commercial catch sampling was carried out on a coastwide basis, with random samples taken of chinook, coho, steelhead, and chum commercial catches. Voluntary returns of sport caught marks also continued. These heads were submitted to one of 165 depots throughout B.C. by participating anglers. All heads collected from adipose-only clipped salmonids were taken to the dissection laboratory where the CWT was extracted and decoded. The tag codes and recovery data were then entered onto an on-line computer system.

Various printouts and in-season reports are produced during the fishing season from data files. The annual report is produced using a series of programs that matches B.C. Catch Statistics data to MRP data and sorts the data into subreports by catch region and species. The 1982 B.C. Catch Statistics data and the MRP sample numbers are reported in Subreport 1, while estimations of marks are found in Subreports 2 and 4. Individual mark recoveries are listed in Subreports 5 to 8,

sorted by species. The tag codes which were recovered during the year and the number of recoveries of each code are presented in Subreport 9, sorted by hatchery. Tables and figures have been included to aid in translating the data codes and abbreviations used by MRP.

GLOSSARY OF TERMS

1. Catch Regions

Catch regions are defined as a grouping of statistical areas by geographical region and fishing gear. Canadian Catch Regions are illustrated in Figure 1. Table 1 presents the catch regions and their corresponding statistical areas in the order in which the regions are found in the subreports.

2. Statistical Areas (STAT AREA)

Statistical areas used in these subreports are the stat areas defined by DFO for reporting catch data. Statistical areas are illustrated in Figure 2. Table 2 lists the statistical areas and subareas corresponding to each numerical code. Numbers in brackets following the stat area code indicate the stat areas which are contained in the combined area.

3. Statistical Subareas (SUB AREA)

Statistical subareas used in these subreports are those defined by DFO, as illustrated in Figure 3. Table 2 defines the subareas contained within each statistical area and gives their numeric codes.

4. Statistical Weeks (STAT WEEK)

Statistical weeks used in the subreports are defined by B.C. Catch Statistics, with weeks beginning on Sunday. Table 3 presents the stat week codes used in the subreports and their corresponding calendar dates.

Data for net catch regions is presented by statistical week. The stat week is reported as a three-digit code in brackets following the calendar date of the last day in the week. Data recovered outside the traditional net fishing season (prior to April 24 and after November 14) are grouped into single pre-season and post-season periods. Data for the troll and sport fisheries are presented by biweekly period. The same week numbers are assigned as for net, but the "weekly period" is the two week period ending on the date shown.

example:

NET	SE 11 (092)	Statistical week 092 corresponds to the week ending September 11.
SPORT/TROLL	SE 11 (092)	Statistical week 092 corresponds to the two week period ending September 11.

5. Label Type (LBL TYP)

Different types of labels are used to identify the recoveries, depending on how the adipose-only clipped salmonid was recovered. Codes used in the subreports to record the label type are presented in Table 4.

6. Head Tag #

Each head recovered by the MRP is identified by a uniquely numbered label, consisting of a label type and a head tag number.

7. Length

Length is reported in millimeters and refers to the nose to fork length.

8. Grade (GD)

During commercial processing, salmonids are separated into round and dressed categories, and graded according to size (weight) and condition. Chinook are further graded by flesh colour (Table 5). Although fish grade information for randomly sampled fish is collected, it cannot be entered using the current on-line computer system.

9. Weight

Weight is measured in kilograms to one decimal place and refers to either round or dressed (head-on) weight as indicated by the grade code. Although weight information for randomly sampled fish is collected, it cannot be entered using the present on-line computer system.

10. Scale Age (SC AG)

Scale age refers to the age of the fish in years as revealed by reading the scales. Scale age data is collected by the MRP but cannot be entered using the current on-line computer system.

11. Gear (GR)

Gear refers to the type of gear used to catch the fish in a particular delivery. Codes used in the reports are presented in Table 6.

12. Sampling Location (SAMP LOC)

The geographical location at which commercially caught fish were sampled and recovered is reported as a two-digit numeric code (Table 7).

13. Location Name, Latitude,and Longitude

For sport recoveries, the catch site, as reported by the angler, is recorded. The corresponding latitude and longitude are reported as follows:

LAT	LONG
4818	12332

48 18 NORTH 123 32 WEST

14. Tag Code Information

AGENCY CODE: The agency code refers to the coded-wire tag word that identifies the tagging agency. For standard binary-coded tags it appears as a two-digit number, while for half-length tags it appears as an alpha character followed by one numeric. With colour-coded, rare-earth element, and x-ray readable tags, the agency code does not signify the tagging agency, but is used as the first data word (see below). Tables 8 and 9 present the codes used for the Agency Word.

In the subreports the following statements are used:

NO-PIN : The fish was missing the adipose fin but there was no other evidence of a coded-wire tag.

LOST-PIN: The coded-wire tag was lost during the dissection process.
NO-DATA : There was a discrepancy with the tag or the head was lost during transport to the lab.
BINARY : The tag was known to be binary coded but the code was unreadable.
COLOUR : The tag was known to be colour coded but the code was unreadable.

Table 10 presents the order in which the tag codes are printed in the subreports.

DATA WORDS: Data refers to the coded-wire tag words that identify individual tagged groups of fish. For binary-coded tags there are two data words, each reported as a two-digit number. Colour and rare-earth tags bear up to three data words (there is no agency code). Table 11 and 12 list the codes for rare-earth and colour tags respectively. When the same code is used more than once in different years, or on different species, *1, *2,*3, etc. is used to keep each tag code record unique.

15. Brood Year (BR YR)

Brood year refers to the year in which the eggs were fertilized.

16. Species (SP)

Recoveries are presented in the subreports in the order chinook, coho, steelhead, and chum.

17. Hatchery

Hatchery refers to the incubation site of hatchery reared fish and the stock of naturally reared (wild) fish. Wild fish are denoted by (W).

18. Agency

Agency refers to the groups which applied the coded-wire tag. Table 13 presents the abbreviations used in the subreports.

19. Release Data

TAGGED: refers to the number of fish in the group which were tagged with the particular tag code.

UNTAGGED: refers to the number of fish in the same group which did not receive coded-wire tags.

DATE: refers to the date on which the group of tagged and untagged fish were released.

FISH/LB: refers to the size of the fish at release (number of fish per pound).

SITE: refers to the site at which the fish were released.

TAGLOSS DAYS: refers to the number of days after tagging that tagloss was examined.

%TAGLOSS: refers to the percentage of tagged fish which had shed their tags when tagloss was examined (included in the total of untagged fish).

20. Run Date

Run Date refers to the date the report was printed from the computer.

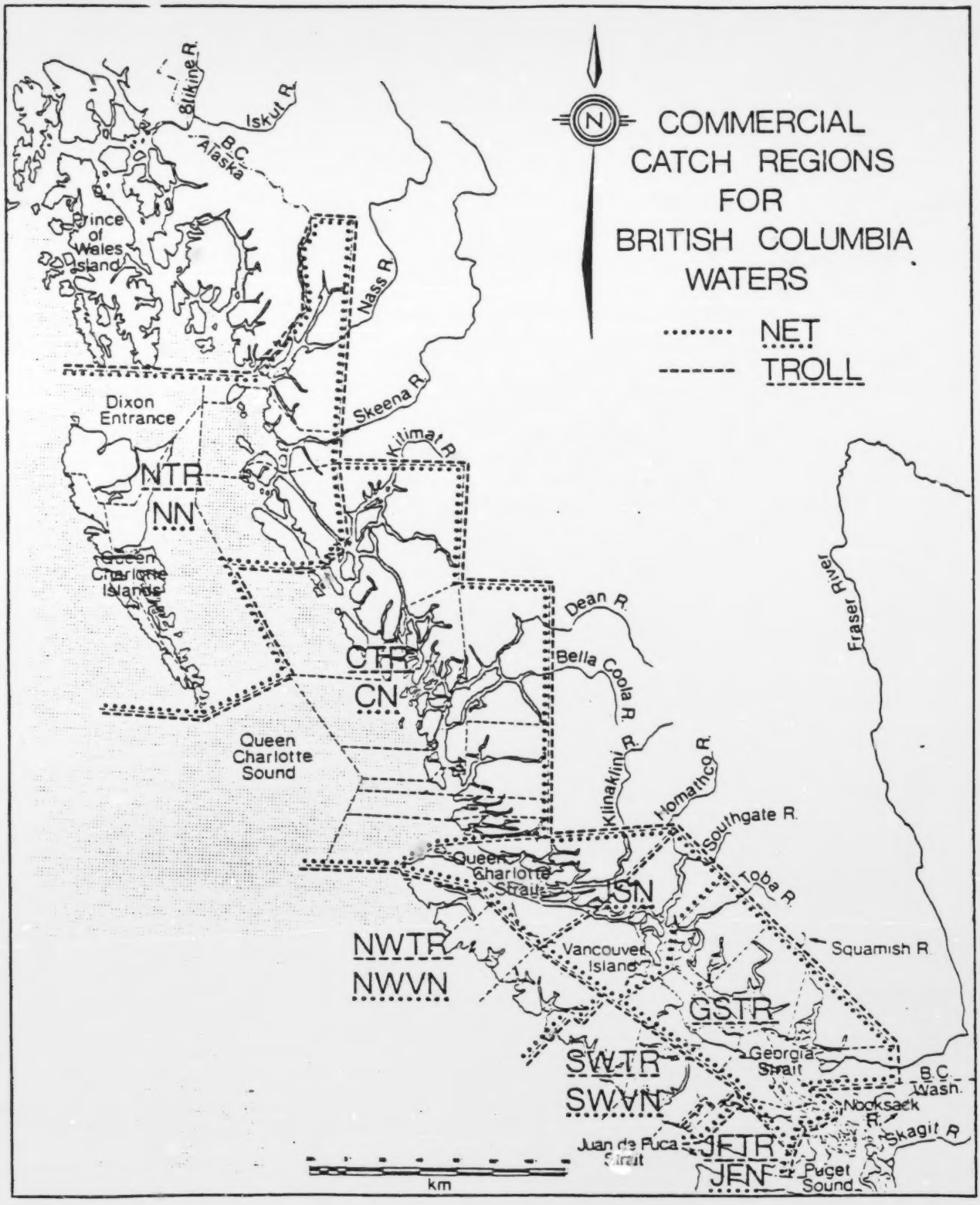


Figure 1. Commercial Catch Regions for British Columbia Waters

Table 1. Catch Regions and their Corresponding Statistical Areas

CODE	ABBREVIATION	CATCH REGION	CORRESPONDING STAT AREAS
06	NTR	Northern Troll	1-5
05	CTR	Central Troll	6-12, 30
01	NWTR	Northwest Vancouver Island Troll	25-27
02	SWTR	Southwest Vancouver Island Troll	21, 23, 24
14	JFTR	Juan de Fuca Troll	20
04	GSTR	Georgia Strait Troll	13-18, 29 A-C
15	C/NWTR	Combination Region	25-27, 6-12, 30
17	NW/SWTR	Combination Region	21, 23, 24-27
47	AN	Alaska Net	
09	NN	Northern Net	1-5
12	CN	Central Net	6-11
20	NWVN	Northwest Vancouver Island Net	25-27
21	SWVN	Southwest Vancouver Island Net	21-24
13	JFN	Juan de Fuca Net	20
11	JSN	Johnstone Strait Net	12, 13
10	GSN	Georgia Strait Net	14-18
08	FGN	Fraser River Gillnet	29 A-E
45	JSN/GSN	Combined Region	12, 13, 14-18
29	FWSP	Freshwater Sport	
25	NSPT	Northern Sport	1-5
26	CSPT	Central Sport	6-12, 30
27	WSPT	West Coast Vancouver Island Sport	21-27
28	GSPT	Georgia Strait Sport	13-20, 28, 29

Figure 2. B.C. Statistical Areas

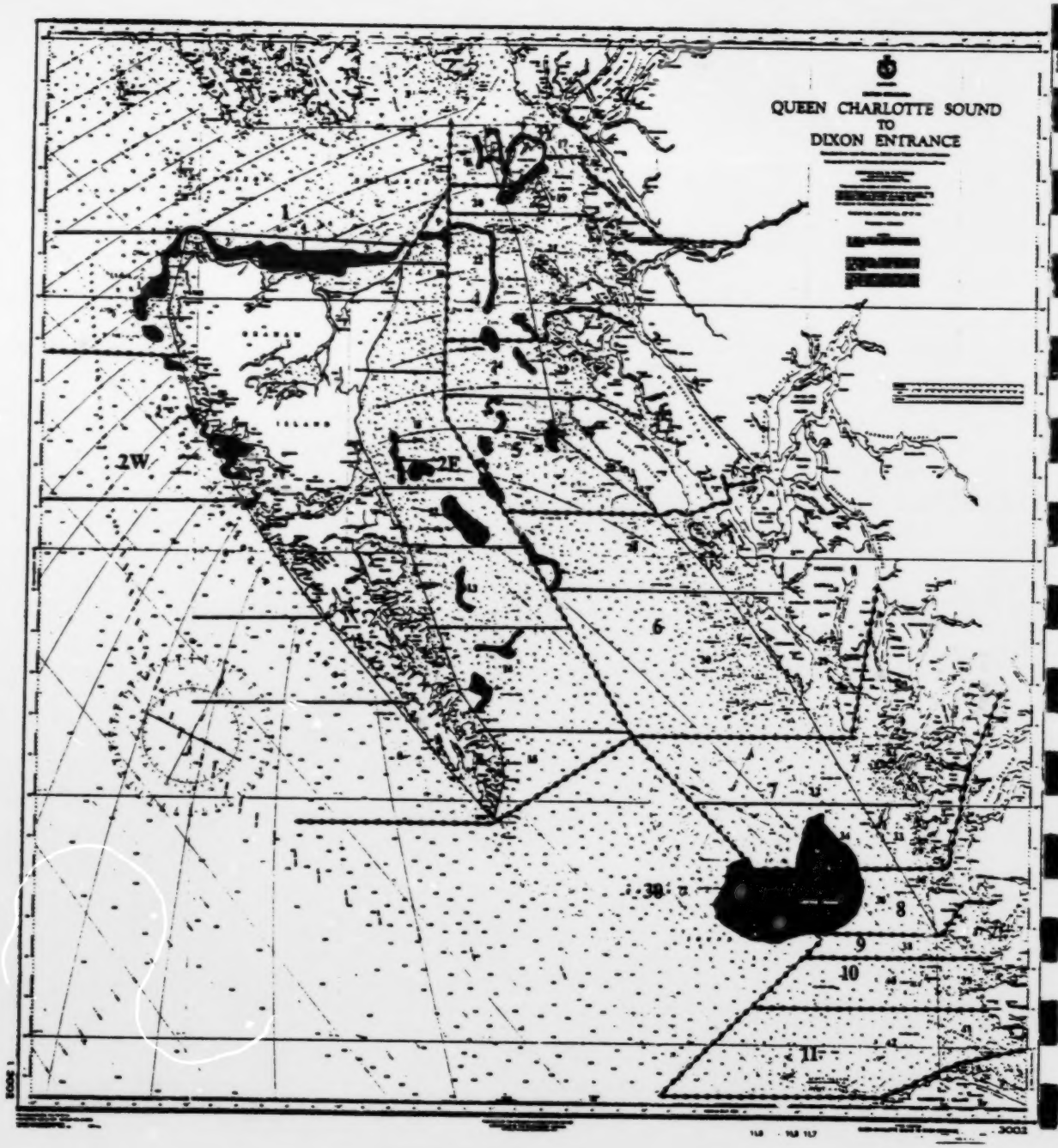


Figure 3a. Northern B.C. Statistical and Sub Areas.

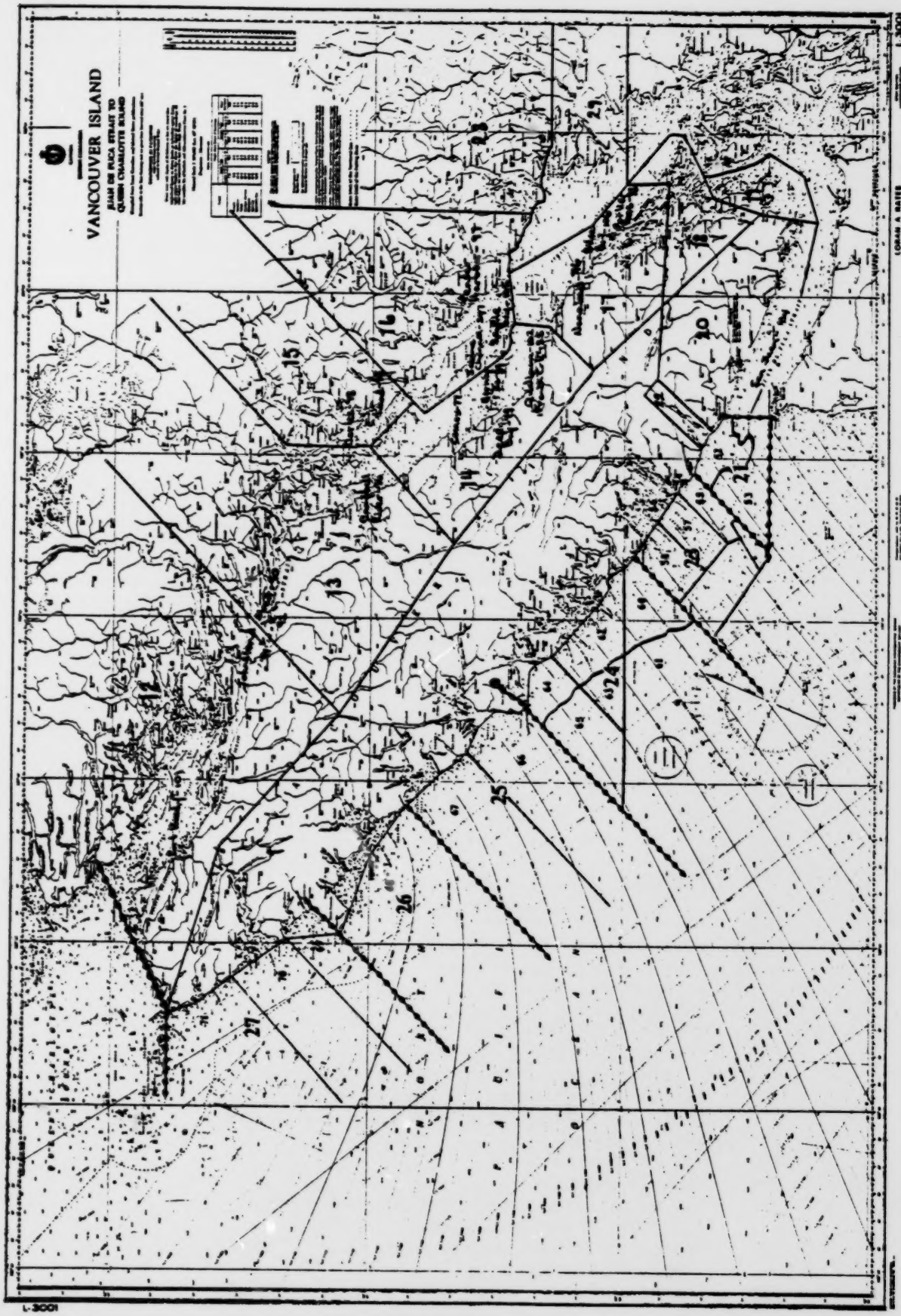


Figure 3b. Southern B.C. Statistical and Sub Areas.

Table 2. B.C. Statistical Areas and Sub-Areas

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
001	001	Tian Head to Langara Point
	002	Langara Point to Wiah Point (inside a line drawn between Langara Point to Rose Spit Red Buoy)
	003	Wiah Point to Rose Spit
	004	North of a line drawn between Langara Point to Rose Spit Red Buoy)
	118	Subs 1 and 2
	119	Subs 1, 2, and 3
	124	Subs 1, 2, and 4
	126	Subs 1 and 3
	134	Subs 2 and 3
	135	Subs 2, 3, and 4
	144	Subs 3 and 4
02W	005	Tian Head to Marble Island
	006	Marble Island to Tasu Sound
	007	Tasu Sound to Gowgaia Bay
	008	Gowgaia Bay to Cape St. James
	154	Subs 6, 7, and 8
02E	009	Rose Spit- north to Corner Boundary for Stats 1-4
	010	Rose Spit to Cape Ball
	011	Cape Ball to Sandspit (includes Lawn Hill, Skidegate Flats and Sandspit Flats
	012	Sandspit to Cumshewa Head
	013	Cumshewa Head to Fuller Point
	014	Fuller Point to Goodwin Point (includes Ramsay Corner and Scudder Point)
	015	Goodwin Point to Cape St. James
	155	Subs 9, 12, and 14
	160	Subs 11 and 12
	161	Subs 11, 12, 13, and 14
	172	Subs 12, 13, 14, and 15
	174	Subs 13 and 14
	313	Subs 9, 10, and 11
002	151	Subs 5, 6, 12, 13, and 14
03X	016	Zayas Island and Dundas Island
03Y	017	Wales Island and Boston Rocks
03Z	018	Portland Inlet
004	019	Inside Surfline- north end of Hudson Bay Passage to Stenhouse Shoal
	020	Outside surfline- north end of Hudson Bay Passage to Stenhouse Shoal
	021	Inside surfline- Stenhouse Shoal to Joachim Rock
	022	Outside surfline- Stenhouse Shoal to Joachim Rock (includes Two Peaks, the Corner, the Cut, Inside Edge, South Flats, the Finger, Oval Bank, and Venus Grounds)
	188	Subs 21 and 22
	301	Subs 19 and 21
005	023	Inside surfline- Joachim Rock to White Rock (includes Browning Entrance)
	024	Outside surfline- Joachim Rock to White Rock (includes Freeman Pass)
	025	Inside surfline- White Rock to Joseph Island

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
		(includes Principe Channel)
	026	Outside surfline- White Rock to Joseph Island (includes Shellgrounds, Brandy Spot, Bonilla Island, Tide Rip, Wayne Spot, and Oly Spot)
	194	Subs 23 and 24
	195	Subs 23, 24, and 25
	196	Subs 23 and 25
	197	Subs 24 and 26
006	027	Inside surfline- Joseph Island to Rennison Island (includes Estevan Sound and Caamano Sound)
	028	Outside surfline- Joseph Island to Rennison Island (includes the Horsehoe)
	029	Inside surfline- Rennison Island to Day Point (includes Laredo Channel and Laredo Sound)
	030	Outside surfline- Rennison Island to Day Point
	200	Subs 27 and 28
	201	Subs 27 and 29
	204	Subs 29 and 30
007	031	Inside surfline- Day Point to north end of Goose Group (includes Milbank Sound and Seaforth Channel)
	032	Outside surfline- Day Point to north end of Goose Group)
	033	Inside surfline- north end of Goose Group to Boundary of Stats 7 & 8 (includes Goose Group and Queens Sound)
	034	Outside surfline- north end of Goose Group to Boundary of Stats 7 & 8 (includes NE corner of Goose Bank, the Ridge and the Bite)
	208	Subs 31 and 33
	212	Subs 33 and 34
008	035	Inside surfline- includes Dean Channel, Burke Channel and Fitzhugh sound)
	036	Outside surfline- includes SE corner of Goose Bank
	302	Dean Channel
	303	Burke Channel
	304	Fitzhugh Sound
009	037	Inside surfline- Rivers Inlet
	038	Outside surfline
010	039	Inside surfline- Smith Inlet
	040	Outside surfline
011	041	Inside surfline- Queen Charlotte Strait and Seymour/Belize Inlets
	042	Outside surfline- Cape Scott to Yankee Spot
	099	Steamer Grounds
	100	Scott Islands
	314	Yankee Spot
012	075	Bull Harbour
	090	Kingcome Inlet- Johnstone Strait
	091	Johnstone Strait
	101	Port Hardy
	103	Knight Inlet
	318	Malcolm/Broughton Island
	319	Goletas Channel
013	076	Campbell River
	092	Johnstone Strait

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
	325	Discovery Passage
014	077	Comox
	079	Deep Bay
	085	French Creek
	089	Hornby Island
	102	Qualicum River Mouth
	296	Subs 79 and 89
015	078	Cortes Bay
	095	Lund
016	097	Pender Harbour
	105	Scottie Bay
	117	Sabine Channel
017	096	Nanaimo
	098	Porlier pass
	106	Silva Bay
	115	Gabriola Pass
	080	East Side of Galiano Island
018		
020	093	Juan de Fuca- Bonilla Point to San Juan
	104	San Juan to Sooke
021	048	Prairies- above Median Line (extension of Area C)
	052	Swiftsure Bank
	053	Non-Swiftsure Bank
022		Nitinat Lake
023	054	Inside surfline- Alberni Inlet
	055	Outside surfline- Pachena Point to Cape Beale (includes 7 & 12 Mile Banks)
	056	Inside surfline- Cape Beale to Boundary of Stats 23 and 24)
	057	Outside surfline- Cape Beale to Loudon Channel
	058	Outside surfline- Loudon Channel to Boundary of Stats 23 and 24 (includes South Bank)
	059	Big Bank (includes Shallow Spot, the Gulley and SW Corner)
	073	Bamfield
	109	Ucluelet
	113	Finger Bank
	247	Subs 55, 57, and 58
	248	Subs 55, 57, and 59
	249	Subs 55, 58, 59, and 113
	250	Subs 55 and 59
	251	Subs 55, 59, and 113
	253	Subs 57 and 59
	255	Subs 58 and 59
	258	Subs 58, 59, and 113
	276	Subs 59 and 113
	316	7 & 12 Mile Bank
	321	Ucluelet- the Wreck
	324	Inside surfline- Ucluelet Inlet
024	060	Inside 50 Fathom Line- Boundary of Stats 23 & 24 to 49th Parallel
	061	Outside 50 Fathom Line- Boundary of Stats 23 & 24 to 49th Parallel
	062	Inside 50 Fathom Line- 49th Parallel to Rafael Pt
	063	Outside 50 Fathom Line- 49th Parallel to Rafael Pt

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
	064	Inside 50 Fathom Line- Rafael Point to Estevan Pt
	065	Outside 50 Fathom Line- Rafael Point to Estevan Pt
	108	Tofino
	277	Subs 60 and 61
	278	Subs 60 and 62
	280	Subs 61 and 62
	281	Subs 61, 62, and 63
	282	Subs 61 and 63
	283	Subs 61, 63, and 65
	284	Subs 62 and 63
	285	Subs 62 and 64
	287	Subs 63 and 65
	288	Subs 64 and 65
	311	Long Beach
	328	Clayoquot Sound
025	066	Estevan Point to Bajo Point (includes Nootka Sound)
	067	Bajo Point to Tatcho Pt (includes Esperanza Inlet)
	329	Nootka Sound
026	068	Tatcho Point to Cape Cook
	094	Kyuquot Sound
027	069	Cape Cook to Lawn Point
	070	Lawn Point to Topknot Point
	071	Topknot Point to Cape Scott
	112	Winter Harbour
	293	Subs 69 and 70
	294	Subs 70 and 7
	295	Subs 70 and 112
	330	Quatsino Sound
29A,B,C	081	Fraser River Mouth
29D	082	Fraser River Freshwater
029	084	Fraser River General
030	072	Area 30-includes NW, SW, and SE corners Goose Bank)
031	114	Alaska
	116	Ketchikan, Alaska
032	086	Georgia Strait
034 (1,2E,5)	128	Subs 1, 3, 14, and 26
	145	Subs 3, 9, and 24
035 (1,2W)	120	Subs 1, 2, 3, and 5
	125	Subs 1, 2, 5, and 6
	129	Subs 1 and 5
	141	Subs 2 and 5
036 (1,2E)	121	Subs 1, 2, 3, and 9
	127	Subs 1, 3, and 9
	132	Subs 1 and 9
	136	Subs 2, 3, 4, and 9
	142	Subs 2 and 9
	147	Subs 3 and 11
	150	Subs 4 and 9
037 (1,2E,3)		
038 (1,2E,4)	148	Subs 3, 11, and 22
039(1,2E,4,5)	149	Subs 3, 11, 22, and 25
040 (1,2)	130	Subs 1, 5, and 12
	322	Subs 1, 2, 5, and 9
041 (1,2,4)	131	Subs 1, 5, 12, and 22
042 (1,2W,4)		

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
043 (1,3X)	122	Subs 1, 2, 3, and 16
044 (1,3Y)	137	Subs 2, 3, and 17
	143	Subs 2 and 17
045 (1,4)	123	Subs 1, 2, 3, and 22
	133	Subs 1 and 21
	138	Subs 2, 3, and 22
047 (1,5)	139	Subs 2, 3, and 24
	140	Subs 2, 3, 24, and 26
050 (2E,3X,4)		
051 (2E,4,5)	162	Subs 11, 12, 13, 22, 24, and 26
	163	Subs 11, 12, 13, 24, and 26
	165	Subs 11, 13, 14, 22, and 26
	168	Subs 11, 22, 24, and 26
	169	Subs 11, 22, and 26
052 (2W,4)		
053 (2W,5)	153	Subs 5 and 25
054 (2E,2W,5)	152	Subs 5, 11, and 24
058 (2E,3)		
059 (2E,4)	157	Subs 9 and 22
	166	Subs 11 and 21
	167	Subs 11 and 22
	175	Subs 13 and 22
	178	Subs 14 and 22
061 (2E,5)	158	Subs 9 and 26
	159	Subs 10, 11, and 26
	164	Subs 11, 12, and 26
	170	Subs 11 and 25
	171	Subs 11 and 26
	173	Subs 12 and 26
	176	Subs 13 and 26
	179	Subs 14 and 23
	180	Subs 14 and 26
064 (2,3,4,5)		
066 (3X,3Y)	182	Subs 16 and 17
067 (3X,3Z)	184	Subs 16 and 18
068 (3X,4)	185	Subs 16, 20, and 22
	186	Subs 16 and 21
069 (3Y,4)	187	Subs 17 and 21
070 (3,4)	183	Subs 16, 17, 18, and 21
071 (3,4,5)		
072 (3,5)		
074 (4,5)	189	Subs 21 and 23
	190	Subs 21, 23, and 25
	191	Subs 21 and 26
	192	Subs 22 and 23
	193	Subs 22, 24, and 26
	315	Subs 22 and 24
076 (7,8,30)	219	Subs 23, 26, and 72
080 (6,7)	202	Subs 27, 29, and 31
	203	Subs 27, 30, and 31
	205	Subs 29, 30, 31, 32, and 33
	206	Subs 29 and 31
	207	Subs 30, 32, and 34
081 (6,7,8)		
082 (6,7,9)		

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
083 (7,8)	209	Subs 31, 33, 34, and 35
	210	Subs 31, 33, and 35
	211	Subs 31 and 35
	213	Subs 33, 34, and 35
	214	Subs 33, 34, 35, and 36
	216	Subs 33 and 35
	217	Subs 33, 35, and 36
	218	Subs 34 and 36
084 (7,8,9)		
085 (7,30)		
086 (8,9)	220	Subs 35 and 37
	221	Subs 36 and 37
087 (8,9,10)		
088 (8,9,10,11)		
089 (8-12)		
090 (8,30)		
091 (9,10)	222	Subs 37 and 39
092 (10,11)	223	Subs 39, 40, and 41
	225	Subs 40 and 42
093(10,11,27)	224	Subs 40, 41, 70, and 71
	226	Subs 40, 42, 71, and 112
094 (11,12)		
095 (11,12,27)		
096(11,26,27)	229	Subs 42, 68, 69, 70, and 71
097 (11,27)	228	Subs 41 and 112
	230	Subs 42, 69, 70, and 71
	231	Subs 42 and 71
	232	Subs 42 and 112
098 (12,13)		
099 (12,26,27)		
100 (12,27)		
101 (13,14)		
102 (14,15)	299	Subs 85 and 95
103 (14,16)	297	Subs 79, 89, and 105
104 (14,17)		
	298	Subs 79 and 96
105 (15,16)	300	Subs 95 and 97
106 (16,17)		
107 (16,29)		
108 (17,18)		
109 (17,29)		
110 (17,29A)		
111 (21,23)	233	Subs 48, 52, and 59
	235	Subs 58, 52, and 113
	236	Subs 48 and 59
	237	Subs 52 and 55
	240	Subs 52, 55, and 58
	241	Subs 52, 55, and 59
	242	Subs 52 and 58
	243	Subs 52, 58, and 59
	244	Subs 52 and 59
	245	Subs 52, 59, and 113
	246	Subs 52 and 113
	308	Subs 52, 53, and 59
	309	Subs 52, 53, 59, and 113

STAT-AREA	SUB-AREA	DESCRIPTION OF SUB-AREA
	317	Subs 53, 55, and 57
	323	Subs 48, 53, and 113- the Fence
112 (21,23,24,25)		
113(21,23-26)	238	Subs 52, 55, 57, 58, 60, 62, 64, 66, 67, and 68
114 (23,24)	252	Subs 56, 60, and 62
	254	Subs 57, 61, and 63
	256	Subs 58, 59, and 60
	257	Subs 58, 59, 60, 62, and 64
	259	Subs 58, 60, and 62
	260	Subs 58 and 62
	261	Subs 59, 60, and 61
	262	Subs 59, 60, 61, 62, 63, and 64
	266	Subs 59, 60, and 62
	268	Subs 59, 60, 62, and 113
	269	Subs 59 and 61
	270	Subs 59, 61, and 63
	271	Subs 59, 61, 62, and 65
	272	Subs 59 and 62
	273	Subs 59, 62, and 64
	274	Subs 59 and 64
	275	Subs 59, 64, and 113
	312	Subs 60 and 113
	320	Subs 59 and 60
	326	Subs 58 and 60
	327	Subs 55, 57, 58, and 60
115(23,24,25)	263	Subs 59, 60, 61, 62, 63, 64, 65, 66, and 67
	267	Subs 59, 60, 62, and 66
116 (23-26)	264	Subs 59, 60, 61, 62, 63, 64, 65, 66, 67, and 68
117 (23-27)	265	Subs 59-71
118 (24,25)	279	Subs 60, 62, 64, 66, and 67
	286	Subs 62 and 66
	289	Subs 64, 66, and 67
	291	Subs 65 and 66
119 (24-26)	290	Subs 64, 66, 67, and 68
120 (25,26)	292	Subs 67 and 68
121 (26,27)		
122 (29A,29B)	081	Fraser River Mouth
123 (29B,29D)		
124 (C,21)		
125 (C,23)		
126 (C,23,24)		
127 (13,15)		
128		Alaska Stat Area 101
138 (1,3X,3Y,3Z)		Dixon Entrance
139 (3Y,3Z)		
140 (25,27)		
141 (21,24)	234	Subs 48, 52, and 64
	310	Subs 52 and 62

Table 3. Statistical Week Codes and their Corresponding Calendar Dates

CALENDAR DATE	STATISTICAL WEEK
Dec 27 - Jan 23	010
Jan 24 - Jan 30	015
Jan 31 - Feb 27	020
Feb 28 - Mar 6	031
Mar 7 - Mar 13	032
Mar 14 - Mar 20	033
Mar 21 - Mar 27	034
Mar 28 - Apr 3	041
Apr 4 - Apr 10	042
Apr 11 - Apr 17	043
Apr 18 - Apr 24	044
Apr 25 - May 1	045
May 2 - May 8	051
May 9 - May 15	052
May 16 - May 22	053
May 23 - May 29	054
May 30 - June 5	061
June 6 - June 12	062
June 13 - June 19	063
June 20 - June 26	064
June 27 - July 3	071
July 4 - July 10	072
July 11 - July 17	073
July 18 - July 24	074
July 25 - July 31	075
Aug 1 - Aug 7	081
Aug 8 - Aug 14	082
Aug 15 - Aug 21	083
Aug 22 - Aug 28	084
Aug 29 - Sept 4	091
Sept 5 - Sept 11	092
Sept 12 - Sept 18	093
Sept 19 - Sept 25	094
Sept 26 - Oct 2	101
Oct 3 - Oct 9	102
Oct 10 - Oct 16	103
Oct 17 - Oct 23	104
Oct 24 - Oct 30	105
Oct 31 - Nov 6	111
Nov 7 - Nov 13	112
Nov 14 - Nov 20	113
Nov 21 - Nov 27	114
Nov 28 - Dec 25	120

Table 4. Types of Labels Used to Identify Commercial and Sport Returns

LABEL	DESCRIPTION
O	Disc Tag - round, numbered plastic disc affixed by MRP samplers to a head recovered during random sampling of the commercial catch.
S	Select Disc - numbered plastic disc (same as above) affixed by MRP samplers to marked fish obtained by means other than random sampling. The "S" is coded (denoting a select recovery) to separate this recovery from other recoveries bearing discs.
L	Logbook Strap Tag - numbered, plastic strap affixed by fisherman participating in the Troll Logbook Program. The head is recovered by MRP samplers during random sampling of the commercial catch.
T	Select Head with Logbook Strap Tag - head bearing a plastic strap tag (same as above) which is voluntarily removed by the fisherman and given to the field samplers as a select recovery upon delivery.
F	Freezer Log Tag - numbered, paper label affixed by freezer troller participating in the logbook program. The head is voluntarily removed by the fisherman and given to the MRP samplers as a select recovery.
H	Georgia Strait Head Label - numbered, paper head label affixed by the fisherman when turning a head in at a Georgia Strait Head Depot. This code is generally reserved for voluntary sport recoveries, but is occasionally used by commercial fishermen. The "H" prefix is only used for select recoveries of commercial heads. Any heads bearing a paper label which were encountered during random sampling were re-assigned a disc. All recoveries are select.
V	Central Coast Head Label - numbered, paper head label affixed by the fisherman when turning a head in at a Head Depot in the Central Coast Region. Any commercial recoveries of "V" labels were re-assigned an "H" prefix. All recoveries are select and sport caught.
Q	North Coast Head Label - numbered, paper head label affixed by the fisherman when turning a head in at a Head Depot in the North Coast region. Any commercial recoveries of "Q" labels were re-assigned an "H" prefix. All recoveries are select and sport caught.
A	West Coast Head Label - numbered, paper label affixed by the fisherman when turning a head in at a Head Depot on the West Coast of Vancouver Island. Any commercial recoveries of "A" labels were re-assigned an "H" prefix. All recoveries are select and sport caught.
E	Freshwater Head Label - prefix assigned to any paper label affixed to a head from a freshwater sport caught salmonid. All recoveries are select.

Table 5. Grades Used by Commercial Processors

SPECIES	MRP CODE	GRADE
chinook	01	large red chinook
	02	medium red chinook
	03	small red chinook
	04	jack red chinook
	05	tiny red chinook
	06	large white chinook
	07	medium white chinook
	08	small white chinook
	09	tiny white chinook
	10	large pink chinook
	11	medium pink chinook
	12	small pink chinook
	13	tiny pink chinook
	14	mixed white chinook dressed
	15	mixed red chinook dressed
	18	round jacks (instead of cannery jacks)
	35	mixed red & white chinook dressed
	42	tiny mixed red & white chinook
	43	round chinook +12 lbs.
	44	round chinook -12 lbs.
	46	dressed chinook +12 lbs.
	47	dressed chinook -12 lbs.
	49	mixed white chinook round
	58	mixed red chinook round
	59	red gillnet chinook -7 lbs.
	60	red gillnet chinook 7 - 11 lbs.
	79	large mixed red & white chinook
	80	medium mixed red & white chinook
	81	small mixed red & white chinook
	82	white chinook -10 lbs.
	85	white chinook +10 lbs.
	86	medium & small white chinook
	87	red chinook +18 lbs.
	88	red chinook +10 lbs.
	89	red chinook -10 lbs.
	91	undersized chinook
	92	mixed red & white chinook round
	94	mixed red & white chinook round & dressed

Table 5 continued...

SPECIES	MRP CODE	GRADE
steelhead	93	steelhead mixed
chum	96	chum mixed
sockeye	97	sockeye mixed
pink	98	pink mixed
coho	20	large coho
	21	small coho
	22	tiny coho
	24	mixed coho dressed
	25	cannery coho dressed
	27	medium coho
	48	mixed coho round
	53	coho 4 - 6 lbs.
	55	coho 2 - 4 lbs.
	56	coho 6 - 10 lbs.
	61	coho dressed +7 lbs.
	62	coho dressed -7 lbs.
	63	coho round +8 lbs.
	64	coho round -8 lbs.
	69	coho 3 - 7 lbs.
	71	coho +10 lbs.
	72	coho 7 - 10 lbs.
	73	coho round 7 - 10 lbs.
	74	coho 9 - 11 lbs.
	83	coho dressed 3 - 5 lbs.
	84	coho 5 - 7 lbs.
	95	large & medium coho

Table 6. Fishing Gear Codes

CODE	GEAR
1	gillnet
2	seine
3	troll (mixed)
4	troll (day camp boat)
5	troll (ice boat)
6	troll (freezer boat)
7	sport
8	net (mixed)

Table 7. Codes Used for Sampling Locations

CODE	LOCATION
01	Steveston
02	Vancouver Waterfront
04	Namu
05	Prince Rupert
06	Port Hardy
07	Tofino
08	Ucluelet

Table 8. Agency Codes for Binary Tags

I. Standard Length Binary Tags:

AGENCY MICRO-CODE	ABBREVIATION	AGENCY
00	variable	Multiple Agency Use
01	WDF	Washington Department of Fisheries
02	CFSO	Canada Dept. Fisheries & Oceans - Operations
03	NMFS	National Marine Fisheries Service *Alaska and Seattle/Columbia River through 1981 *Alaska Region only 1982
04	ADFG	Alaska Department of Fish & Game *SE and South Central Regions through 1981 *SE Region only 1982
05	FWS	U.S. Fish & Wildlife Service
06	CDFG	California Department of Fish & Game
07	ODFW	Oregon Department of Fish & Wildlife
08	CFSR	Canada Dept. of Fisheries & Oceans - Research
09	ODFW	Oregon Department of Fish & Wildlife
10	IDFG	Idaho Department of Fish & Game
11	UW	University of Washington
12	BCFW	British Columbia Fish & Wildlife
13	WDF	Washington Department of Fisheries
14	FWS	U.S. Fish & Wildlife Service
15	WDF	Washington Department of Fisheries
23	NMFS	National Marine Fisheries Service *Seattle/Columbia River 1982
31	ADFG	Alaska Department of Fish & Game *South Central Region 1982
47	MIC	Metlakatla Indian Community
60	OAF	Oregon Aqua-Foods
62	variable	Multiple Agency Use
63	WDF	Washington Department of Fisheries

II. Binary Half Length Tags:

AGENCY MICRO-CODE	ABBREVIATION	AGENCY
H0	variable	Multiple Agency Use
H1	WDF	Washington Department of Fisheries
H2	CFSO/CFSR	Canada Department of Fisheries & Oceans
H3	NMFS	National Marine Fisheries Service
H4	ADFG	Alaska Department of Fish & Game
H5	FWS	U.S. Fish & Wildlife Service
H6	CDFG	California Department of Fish & Game
H7	ODFW	Oregon Department of Fish & Wildlife
B4	ADFG	Alaska Department of Fish & Game

Table 9. Miscellaneous Binary Codes

CODE	MEANING
XX	X-Ray Readable Binary
HF	Binary Half Length Tag (Agency Code 15)
H	Binary Half Length Tag (Agency Codes 00 to 07)
B	Binary Half Length Tag (Agency Codes 00 to 15)

Table 10. Tag Code Print Order

1. Canadian Binary Coded Wire Tags

    Agency 02
    Agency 08
    Agency 12
    Agency H2

2. American Binary Coded Wire Tags

    Agency 01
    Agency 03
    Agency 04
    Agency 05
    Agency 06
    Agency 07
    Agency 09
    Agency 10
    Agency 11
    Agency 13
    Agency 14
    Agency 15
    Agency 23
    Agency 31
    Agency 47
    Agency 60
    Agency 62
    Agency 63
    Agency H0
    Agency H1
    Agency H3
    Agency H4
    Agency H5
    Agency H6
    Agency H7
    Agency B4

3. Colour Coded Wire Tags and Rare-Earth Tags in alphabetical order

4. Unreadable, incomplete, or badly scratched BINARY tags

5. Incomplete COLOUR sequence tags

6. NO-PIN recoveries

7. LOST-PIN recoveries

8. NO-DATA recoveries

Table 11. Rare-Earth Element Codes

ABBREVIATION	ELEMENT	ABBREVIATION	ELEMENT
Ce	Cerium	Nd	Neodymium
Dy	Dysprosium	Pr	Praseodymium
Er	Erbium	Sm	Samarium
Gd	Gadolinium	Tb	Terbium
Ho	Holmium	Yb	Ytterbium
La	Lanthanum		

Table 12. Colour Codes

COLOUR CODE	NUMERIC CODE	COLOUR
BL	72	blue
BR	73	brown
CY	93	chrome yellow
DB	99	dark blue
GD	95	gold
GM	97	metallic grey
GN	75	green
GY	74	grey
LA	96	lavender
LB	76	light blue
LG	77	light green
MG	94	medium green
MX	87	mixed colours
OR	78	orange
PK	82	pink
PU	83	purple
RD	84	red
VI	98	violet
WH	70	white
XR	80	oxide red
XY	81	oxide yellow
YW	86	yellow

Table 13. Abbreviations of Tagging Agencies

TAGGING AGENCY CODE	AGENCY NAME
ADFG	Alaska Department of Fish & Game
ANAD	Anadromous Incorporated
BCFW	British Columbia Fish & Wildlife Branch
BHSR	Burnt Hill Salmon Ranch
CDFG	California Department of Fish & Game
CEDC	Clatsop Economic Development Committee
CFSO	Canada Department of Fisheries & Oceans - operations
CFSR	Canada Department of Fisheries & Oceans - research
COOP	Washington Department of Fisheries - Cooperative
DOMS	Domsea Farms Incorporated
ELWH	Elwah Indian Tribe
FRI	Fisheries Research Institute, University of Washington
FWS	U.S. Fish & Wildlife Service
HOH	Hoh Indian Tribe
IDFG	Idaho Department of Fish & Game
LUMM	Lummi Indian Tribe
MIC	Metlakatla Indian Community
NISQ	Nisqually Indian Tribe
NMFS	National Marine Fisheries Service
NSRA	Northern SE Regional Aquaculture Association
NYKA	Northern Yukon/Kuskokwim Aquaculture Association
OAF	Oregon Aqua-Foods Incorporated
ODFW	Oregon Department of Fish & Wildlife
QDNR	Quinault Department of Natural Resources
SJ	Sheldon Jackson College
SKAG	Skagit System Cooperative
SOF	Silverking Oceanic Farms
SSRA	Southern SE Regional Aquaculture Association
STIL	Stillaguamish Indian Tribe
TULA	Tulalip Indian Tribe
UW	College of Fisheries, University of Washington
WDF	Washington Department of Fisheries
WDF	Washington Department of Game
YAKI	Yakima Indian Tribe

EDP INFORMATION

MARK RECOVERY SYSTEM OVERVIEW

The Mark Recovery System is a three part system consisting of an on-line system, an Annual Batch Report System, and a Batch Request System. The on-line system is used to update and edit data within the Mark Recovery System. The Annual Batch Report System generates the various reports required on an annual basis and the Batch Request System generates other batch reports specially requested. Currently, the sytem is run on an IBM 370 using the OS/VSQ V07C operating system. Block Brothers is the contract firm for this operation.

Data for the Data base system is received from four primary sources:

1) Release Data - release data from both Canadian and U.S. agencies is keypunched, edited, and loaded into the Hatchery File as each new tag code is encountered in the recovery data.
2) Random Samples and Select Returns - data from random samples and select returns from the Commercial Fishing Industry is recorded on special coding forms, matched with the decoded tag code, and keypunched on-line into the Data Base. In the Data Base, the Recovery Data is placed into the Commercial 1 File and the Sampling Data is placed into the Commercial 2 File.
3) Voluntary (Select) Returns - the recovery data and decoded tag codes from voluntary returns of sport caught heads are keypunched on-line into the select sport file after both manual and computer edits. The Location and Depot Files, which are regularly maintained and updated, are used in the editing procedures and to supply additional information to the file.
4) Canadian Commercial Catch Information - this data is supplied to the Mark Recovery Program by the Catch Statistics Bureau. Various system programs are used to convert this data and summarize catches into the equivalent Mark Recovery area-time strata. This data is used at the report level for estimation of Total Random Recoveries in end-season reports.

The system is represented diagramatically in Figure 4.

METHOD OF ESTIMATING RECOVERIES

For any tag code, estimates of that code in a particular area(gear)-time strata are calculated if there exists the associated commercial catch and random sample data. Recovery expansion is not done on samples from combined area (gear) strata. The Catch:Sample ratio is calculated for the particular area-time strata and then multiplied by the number of observed marks for the particular tag code in the sample to produce the estimated recoveries of the tag.

$$\text{TOTAL ESTIMATED RECOVERIES OF A PARTICULAR TAGCODE IN AREA - TIME } i \quad j = \frac{\text{COMMERCIAL CATCH}_{ij}}{\text{SAMPLE}} \times \text{OBSERVED RECOVERIES OF THE PARTICULAR TAGCODE IN } (i,j)$$

For reporting purposes, the Catch:Sample ratio is rounded to one decimal place and the Estimated Total Recoveries of the particular tag code is rounded to the nearest whole number. The observed and estimated recoveries and the C/S ratio are reported in Subreport 1 for each area(gear)-time and species strata.

Select (sport) data is currently not expanded to provide an estimate of

Total Estimated Recoveries; only observed sport recoveries are reported. The reason for this arises from the lack of concensus as to the appropriate expansion factors, called Awareness Factors, to apply to the sport data. Provision exists in the system to incorporate these factors when they become available.

ERROR SOURCES AND DATA LIMITATIONS

Biases in the reported data recoveries (randomly sampled commercial data) arise from violation of sampling assumptions. The main assumptions are that sampling effort is random, that sampling effort is constant, and that sampled recoveries are truly representative of the fishery in the particular area-time strata.

The MRP tries to maintain a representative random sampling rate on the fishery in all strata, but unforseen circumstances can lead to deviation from randomness. For estimated recoveries, error sources stem from Catch Statistics and the covariances between the total catch reported and the data recovered. Such problems can lead to situations where more fish were sampled in an area-time strata than were reportedly caught. Mark Recovery has little means of correcting Catch Statistics data. Further statistical problems occur due to very low observed recoveries of a particular tag code. Inherent errors due to such rare events can lead to tremendous biases in the Estimated Recoveries. Interested readers are referred to the section on Rare Items on page 76 of Cochran (1977) and to pages 118 and 486 of Seber (1982).

In general, the formula used to calculate Total Estimated Recoveries can lead to potentially misleading estimates. The user is requested to keep this in mind when analyzing Mark Recovery data. Sport data is inherently biased due to it being a voluntary return system rather than being randomly sampled.

NOTE ON THE REPORTING OF TROLL CAUGHT MARKED SALMONIDS

Observed and estimated numbers of caught salmonids from the troll fisheries are reported on a biweekly basis. In 1982, an attempt was made to redistribute the reported freezer troll catch over the troll season, rather than to attribute the freezer catch to the week it was landed. To do this, only the ice and day boat catch was used in calculating the Catch:Sample ratio. A percentage of this catch was then added to account for the freezer catch taken from the region. Table 14 shows the freezer catch, the total troll catch, and the percentage the freezer boats account for of the total catch by catch region and species.

The following method was used in calculating and reporting estimated marks for the fishery:

1) The observed number of recoveries for each week of the biweekly period were added together and their sum reported.
2) The estimated number of marks in the ice/day boat catch was calculated for each weekly period by multiplying the observed recoveries for the particular week by the Catch:Sample ratio of the corresponding week.
3) The estimated number of marks in the freezer catch was calculated for each weekly period by multiplying the estimated number of marks in the ice/day troll catch by the Freezer/Total Troll ratio for the corresponding catch region.
4) The estimated number of marks for the ice/day and freezer catch were added together and rounded for each weekly period.
5) These weekly estimated number of marks were added together by the corresponding biweekly period.

6) The observed and estimated mark recoveries were then reported for the biweekly period.

A large bias in the estimated number of marks may be produced if there is a large discrepancy in either the catch or the sample over the biweekly period.

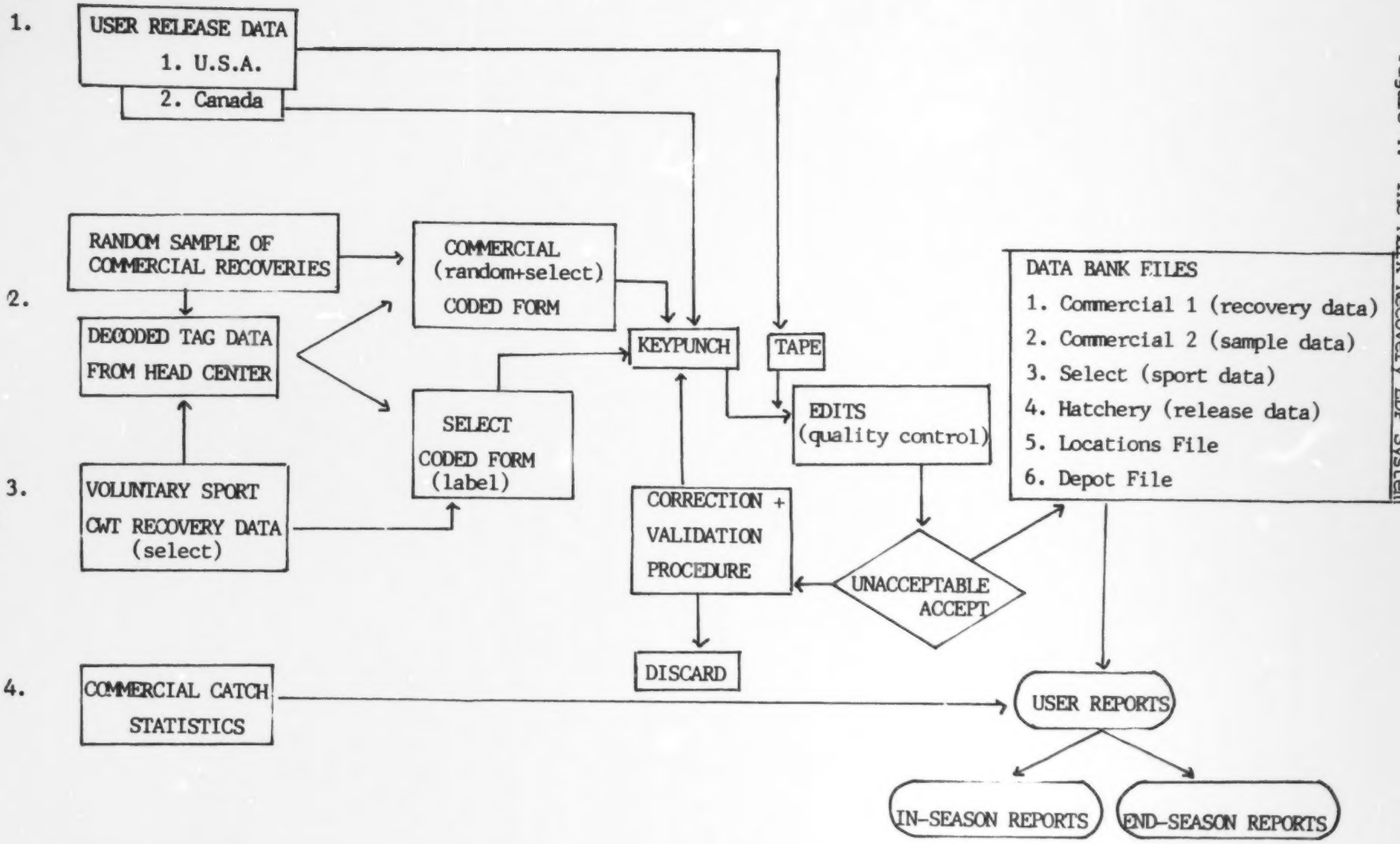


Figure 4. The Mark Recovery EDP System

Table 14. Freezer Troll Catch

CATCH REGION	SPECIES	FREEZER CATCH	TOTAL TROLL CATCH	FREEZER/TOTAL RATIO
NTR	CHINOOK	35,881	174,147	.206
	COHO	61,151	394,311	.155
	CHUM	1,2200	5,788	.211
	STEELHEAD	198	290	.683
CTR	CHINOOK	11,551	72,731	.155
	COHO	20,392	209,785	.097
	CHUM	347	6,043	.057
	STEELHEAD	11	82	.134
NWTR	CHINOOK	38,357	106,325	.361
	COHO	163,075	461,621	.353
	CHUM	6,504	43,599	.149
	STEELHEAD	8	97	.082
SWTR	CHINOOK	75,207	437,458	.172
	COHO	288,023	1,315,815	.219
	CHUM	3,019	19,588	.154
	STEELHEAD	33	171	.193
JFTR	CHINOOK	121	208	.582
	COHO	577	1,593	.362
	STEELHEAD	0	1	.000
GSTR	CHINOOK	2,083	178,498	.012
	COHO	1,741	115,693	.015
	STEELHEAD	0	22	.000

ORGANIZATION AND CONTENT OF SUBREPORTS

SUBREPORT 1: Catch, Sample Size, Marks and Computed Ratios

Subreport 1 is a record of the total number of chinook, coho, steelhead, and chum reportedly caught by B.C. commercial fishermen, the effort expended by the Mark Recovery Program to retrieve marked salmonids, and the number of adipose-only salmonids recovered from the commercial fishery. The Catch:Sample ratio (C/S) is computed for use in subsequent subreports to expand observed numbers of marks to estimated total numbers of marks in the fishery. A star (*) followed by a C/S equal to 1.0 indicates that the number of fish sampled by the MRP was greater than the catch reported by sales slips to Catch Statistics. Expressed as Sample:Catch percent (S/C %), this ratio provides the user with a more easily interpreted measure of MRP sampling effort. The third computed ratio presented, the Sample:Mark ratio (S/M), indicates the incidence of marked fish in the catch.

For troll catch regions, the reported catch is from ice and day boats only. Freezer troll boat catches are reported in Table 14. Freezer boats are not randomly sampled by MRP.

Subreport 1 is organized by catch region, with troll regions presented first, followed by net regions. Within each catch region, the information is presented on a weekly basis with all time periods having either a reported catch or sample included. Calculations of ratios are not made for samples taken from combination regions (fisheries spanning more than one catch region) as no Catch Statistics are available. An example of data from Subreport 1 is given in Figure 5.

Figure 5.

CATCH REGION: NTR

Data for the week ending March 8 (statistical week 031)

Totals for chinook captured in NTR during year. Ratios are computed from the total species catch and sample and are not weekly averages

	MROB (031)	AP (044)	MV (045)		TOTALS
CHINOOK CATCH	50	11	1152	← A total of 1152 chinook landed during week 045.	159050
SAMPLE	--The catch was not randomly sampled for marks.	19	412	← A total of 412 chinook from the total catch were randomly sampled for marks	37060
MARKED	--No marked fish were recovered by random sampling.	1	12	← Of the 412 fish randomly sampled 12 adipose-only clipped fish were found.	1289
C/S	--No ratios can be calculated	*1.0	2.8	← For each fish examined for marks, 2.8 fish were captured in NTR. The ratio is rounded to 1 decimal although a higher degree of accuracy is used in expanding observed numbers of marks to estimated numbers.	4.3
S/C %		172.7	35.8	← 35.8% of the catch was randomly examined for marks.	23.3
S/M		19.0	34.3	← For every marked fish in the catch of 1152 chinook, there were an estimated 34.3 unmarked fish.	28.8

Asterisk denotes discrepancy between catch & sample. When the number sampled is greater than the catch, the C/S ratio is reported as 1.0 and marked with an asterisk. This number is used in the expansions of subreports 2 & 5

*** Asterisks separate catch regions

SUBREPORT 2: Observed and Estimated Recoveries of Marked Salmonids

Subreport 2 contains numbers of recoveries of each tag code by time period for marked chinook, coho, steelhead, and chum. For the randomly sampled commercial fisheries, observed and estimated numbers are presented. Observed numbers only are given for the non-random recoveries from the commercial and voluntary sport fisheries and for recoveries from combination catch regions since no expansion factors are available.

Estimated recoveries of randomly sampled catches are computed by multiplying the observed recoveries by the C/S ratio from Subreport 1. For troll recoveries, a percentage is added to acount for the unsampled freezer catch (Table 14). Equal numbers for observed and estimated recoveries do not necessarily indicate 100% sampling effort. In cases where the number of fish sampled by the MRP was greater than the catch reported by sales slips to Catch Statistics, 1.0 was used as the C/S ratio.

Subreport 2 is organized by catch regions, with troll regions presented first, followed by net and sport regions. Within each region, recoveries of chinook, coho, steelhead, and chum by tag code are printed consecutively. For the troll and sport fisheries data is presented by biweekly period, while for the net fishery it is presented by weekly period. The data is printed across two pages, listed 'a' and 'b'. An example of the format is given in Figure 6.

SUBREPORT 2

Figure 6.

CATCH REGION: NTR

Tagcode; tagging agency
brood year;hatchery
numbers tagged & untagged

Totals for tagcode
captured in NTR
during year

Data for bi- weekly period ending
June 7 (statistical week 071)

AG: 01 02 03 AGCY BR HATCHERY NO. TAG/NO. UNTAG		TOTALS	JUN (071)
04: 17 49 ADFG 77 DEER MTN (KT) 9065/22211	OBS EST	9 42	1 ← one tag of code 4-17-49 was recovered during stat. week 071 3 ← estimated 3 tags were recovered by commercial fishing (obtained by multiplying observed recoveries by C/S ratio from subreport 1)
TOTAL COHO	OBS EST	1289 5928	← total observed & estimated recoveries of coho in NTR including all tag codes, NO-PIN, LOST-PIN, & NO-DATA categories
... dots separate species			
TOTAL NTR	OBS EST	1445 5928	← total observed & estimated recoveries of salmonids (all species) in NTR

Tagging data from "Pacific Salmonid Coded Wire Tag Release Through 1981" (J.K. Johnson 1982)

*** asterisks separate catch regions

SUBREPORT 3: Georgia Strait Sport Catch Total Recoveries of Marked Salmonids (no data available)

SUBREPORT 4: Observed and Estimated Recoveries of Marked Salmonids

Subreport 4 lists the number of recoveries of each tag code for marked chinook, coho, steelhead, and chum. For the randomly sampled commercial fisheries observed and estimated recoveries are presented. Since no expansion factors are available for non-random commercial and voluntary sport fisheries and for combination regions, observed recoveries only are given for these fisheries. Recoveries are listed by catch region for each tag code, in comparison to Subreport 2 where observed and estimated recoveries are listed by tag code for each catch region.

Estimated recoveries of randomly sampled catches are computed by multiplying the observed recoveries by the C/S ratio from Subreport 1. For troll recoveries, a percentage is added to account for the unsampled freezer catch (Table 14). Equal numbers of observed and estimated recoveries do not necessarily indicate 100% sampling effort. In cases where the number of fish sampled by the MRP was greater than the catch reported by sales slips to Catch Statistics, 1.0 was used as the C/S ratio.

Subreport 4 is organized by tag code within each species, with species printed in the order chinook, coho, steelhead, and chum. Within each tag code, troll recoveries are printed first, followed by net and sport. For the troll and sport fisheries data is presented by biweekly period, while for the net fishery it is presented by weekly period. Examples of the formats used for commercial and sport recoveries are given in Figures 7 and 8.

Figure 7.

COMMERCIAL FORMAT

Tagging agency, brood year, hatchery & release data taken from "Pacific Salmonid Coded Wire Tag Releases Through 1981" (J.K. Johnson 1982)

AGENCY CODE: 02 DATA: 16 31 AGENCY: OFSO RELEASE DATA: TAGGED: 69203 UNTAGGED: 37284 DATE: 00/07/77 FISH/LB 84.9
BR YR: 76 SPECIES: CHINOOK HATCHERY: ROBERTSON H. SITE: ROBERTSON CREEK TAG LOSS DAYS: %TAG LOSS: 1.3

WEEKLY PERIODS DATE:	TOTALS		CATCH REGIONS: NET AN	WN	NN	ON	NWN	SWN	JFN	JSN	GSN	FGN	NN/ON	ON/JSN	JFN/GSN	JSN/GSN	GSN/FGN
SE 06	OBS	2						2									
	EST	11						11									

← total observed & estimated recoveries of tagcode in fishery during week ending September 06

← observed recoveries of tagcode in SWN during week ending Sept. 06

← estimated recoveries of tagcode obtained by multiplying observed recoveries by C/S ratio from Subreport 1.

Total observed & estimated recoveries of tagcode in fishery during the year.

FISHERY	OBS	38		4	3		27	2	2
TOTAL	EST	107		18	9		74	2	4

... dots separate fishery

		TROLL	NET	SPORT	TOTAL	ESCAPE	% EXPLOIT	% SURVIVAL
GRAND	OBS	70	38	9	117			
TOTAL	EST	233	107		340			

Total observed & estimated recoveries of tagcode during year.
*** asterisks separate tagcodes

Figure 8.

SPORT FORMAT

BI WEEKLY DATE:		CATCH REGIONS: SPORT TOTALS	NSPT	CSPT	WSPT	GSPT	GSPT BY STATISTICAL AREA (13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(28)	(29)
MY 10	OBS	6			1	5	2	1			1				1	
	EST															

Georgia Strait recoveries are reported as a total for the region and broken down by Statistical Area.

SUBREPORTS 5, 6, 7, AND 8: Canadian Recoveries of Chinook, Coho, Steelhead, and Chum

Subreports 5, 6, 7, and 8 list all random and select recoveries of individual adipose-marked chinook, coho, steelhead, and chum respectively. Included are details of the recovery and biological data associated with each fish.

Within each subreport, recoveries are ordered by tag code, catch region, statistical week, and head number, with commercial recoveries printed before sport recoveries and random before select recoveries within the commercial catch regions. Examples showing formats used for the sport and commercial recoveries are shown in Figures 9 and 10.

Figure 9.

COMMERCIAL

Brood year, hatchery, release site, tagging agency for tagcode from "Pacific Salmonid Coded Wire Tag Releases Through 1980" (PMFC 1981). Page number indicating where within tagcode the particular recovery is located

AGENCY CODE:02 BR YR: 77 HATCHERY: PUNTLEDGE H SITE: PUNTLEDGE R
DATA: 17 19
PAGE: 01 AGENCY: DFSO

type of recovery; label type (table 4); grade, weight & scale age data recorded but not available in report format; fishing gear; sampled in Vancouver (table 7)

CATCH REGION	WEEK LANDED	RANDOM OR SELECT	LBL TYP	HEAD TAG#	LENGTH mm	CD	WEIGHT KG	SC AG	G R	AREA STAT SUB	C/S RATIO	FREEZER RATIO	SAMP LOC
GSTR	JL31(075)	R	0	147043	1003				3	013 076	2.3	.012	02

- JL31(075): data for fish recovered in Georgia Strait Troll during week ending July 31 Stat. Week 075
- R: random recovery
- 1003: fork length in millimeters
- 3: recovered from troller (table 6)
- 013 076: caught in Campbell R. (table 2)
- 2.3: catch: sample ratio from Subreport 1
- .012: proportion freezer trollers take of total troll catch in GSTR
- 02: sampled in Vancouver (table 7)

TOTAL RANDOM OBS: 1 EST: 2 total observed & estimated numbers of random recoveries of tagcode 02 17 19 in GSTR during 1982

select recovery

	AU21(083)	S	S	147676	1060				4	013 000			02

GSTR TOTAL SELECT OBS: 1 recoveries for random and select recoveries are totalled and printed separately for each region

. . . dots separate catch regions

CN	AU21(083)	R	0	066273	0000				2	007 000	3.0		06

0000: no length taken

CN TOTAL RANDOM OBS: 1 EST: 3

* * * asterisks separate tagcodes

SUBREPORT 5

Figure 10.

SPORT

data for bi-weekly period ending Sept 20 Stat Week 093

label type showing area of catch (Table 5)

specific site at which recovery was made

CATCH REGION	WEEK LANDED	SPORT	LBL TYP	HEAD TAG#	AREA STAT SUB	LOCATION NAME	LAT	LONG
		↑ all sport are select recoveries			↑ statistical area of catch		↑ latitude & longitude of recovery location in degree & minutes	
GSPT	SE20(093)	S	H	116657	013	Campbell R	5003	12515

GSPT TOTAL SELECT OBS: 1

SUBREPORT 9: Sub-Hatchery File Listing

Subreport 9 contains the hatchery information for all tag codes recovered in the commercial and sport fisheries during the year. This report is broken into two parts.

Subreport 9A is ordered by tag code, with colour and rare-earth codes preceding binary codes. Codes are ordered alphabetically or numerically within each category. For each tag code, hatchery, release, and recovery information are given. The species and species season (run) codes used are shown in Table 15. The number of fish adipose-clipped only plus the number unclipped will equal the number untagged found in the other subreports. The number of adipose-clipped only fish is available just for Canadian releases. For American releases this number will be included in the number unclipped. Typical method refers to how the fish were reared. A blank indicates an experimental group, 'W' indicates wild stock, and 'Y' indicates regular hatchery production. Total recoveries shown for commericial (troll/net) recoveries are estimated totals while sport recoveries are observed recoveries.

Subreport 9B shows the recoveries of each tag code by catch region. Observed and estimated numbers of recoveries are shown for commercial (net and troll) catch regions while observed recoveries only are shown for sport recoveries. This subreport is ordered first by hatchery or stock, then by species, then by brood year, and finally by tag code. Canadian hatcheries are listed before American ones, in alphabetical order.

Examples of Subreports 9A and 9B are shown in Figures 11 and 12.

Table 15. Species and Species Run Codes

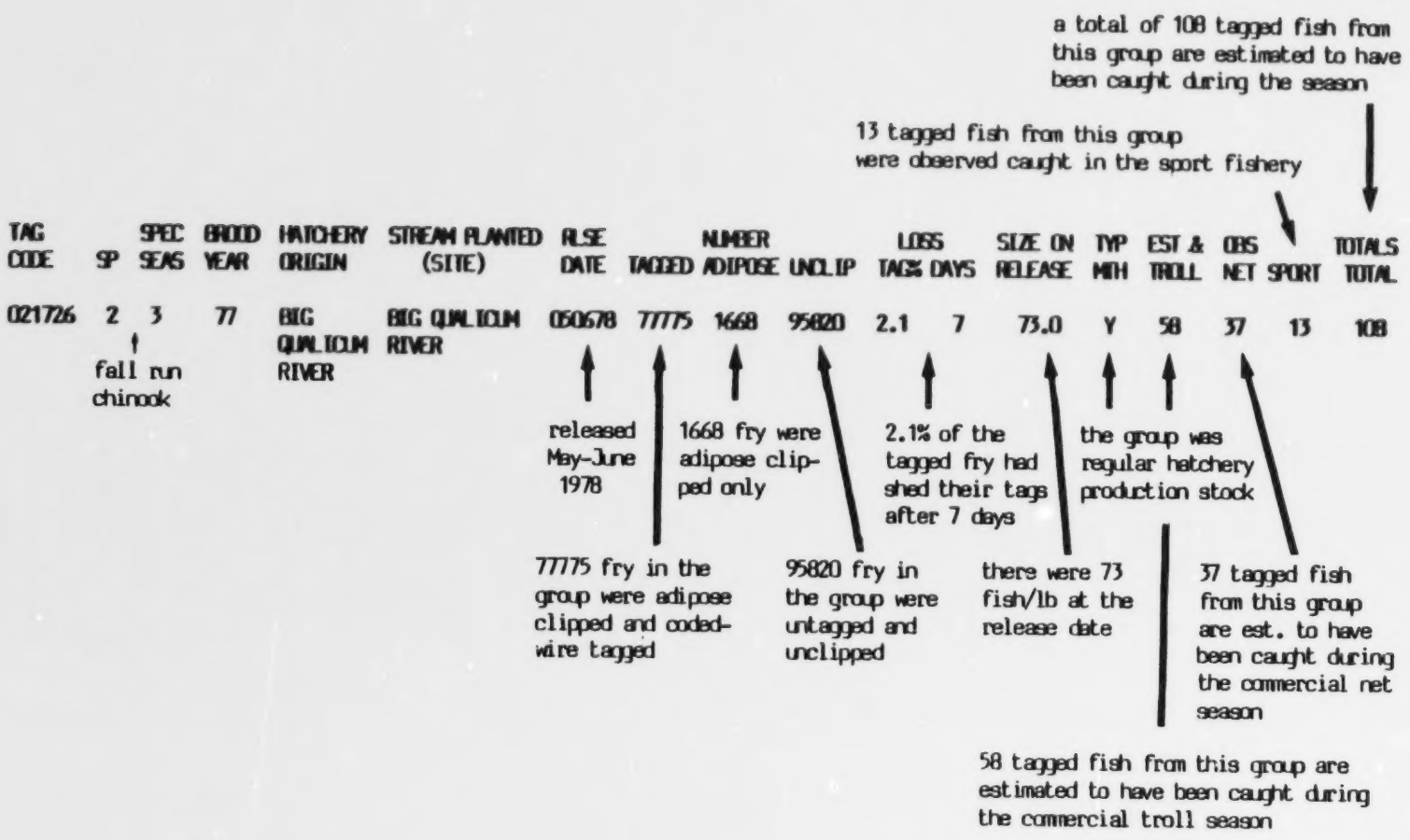
Species:

1 - sockeye
2 - chinook
3 - coho
4 - chum
5 - pink
6 - steelhead
7 - masu
8 - rainbow trout

Species Season:

1 - spring
2 - summer
3 - fall
4 - winter

Figure 11.


a total of 108 tagged fish from this group are estimated to have been caught during the season
13 tagged fish from this group were observed caught in the sport fishery
TAG CODE
SP
SPEC SEAS
BROOD YEAR
HATCHERY ORIGIN
STREAM PLANTED (SITE)
RLSE DATE
NUMBER TAGGED
NUMBER ADIPOSE
NUMBER UNCLIP
LOSS TAG% DAYS
SIZE ON RELEASE
TYP MTH
EST & TROLL
OBS NET
SPORT
TOTALS TOTAL
021726 2 3 77 BIG QUALICUM RIVER BIG QUALICUM RIVER 050678 77775 1668 95820 2.1 7 73.0 Y 58 37 13 108
fall run chinook
released May-June 1978
1668 fry were adipose clipped only
2.1% of the tagged fry had shed their tags after 7 days
the group was regular hatchery production stock
77775 fry in the group were adipose clipped and coded-wire tagged
95820 fry in the group were untagged and unclipped
there were 73 fish/lb at the release date
37 tagged fish from this group are est. to have been caught during the commercial net season
58 tagged fish from this group are estimated to have been caught during the commercial troll season

SUBREPORT 9B

Figure 12.

HATCHERY: GREEN RIVER SPECIES: COHO Recoveries of tag codes from 1978 brood Green River Coho are listed below

BROOD YEAR: 78

TAGCODE : 632121	TROLL	NTR	CTR	NWTR	SWTR	JFTR	GSTR		TOTALS
# TAGGED : 20620	OBS			3	40			observed recoveries of this tagcode in commercial troll fishery	43
# UNTAGGED :	EST			3	354			estimated recoveries of this tagcode in commercial troll fishery	357

SIZE ON RLSE: 25.00

	NET	AN	NN	ON	NWN	SWN	JFN	JSN	GSN	FGN	
	OBS						24	1			total observed recoveries of this tag code in net fishery → 25
	EST						119	2			total estimated recoveries of this tag code in net fishery → 121

	SPORT	FWSP	NSPT	CSPT	WSPT	GSPT	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(28)	(29)	
	OBS					2	1			1							2
	EST																

observed recoveries only of tag code caught in sport fishery. GSPT is reported as a total and broken down by Stat Area

1982 SYNOPSIS

In 1982, the Canadian Salmonid Catch Sampling and Mark Recovery Program (MRP) completed its ninth year of sampling the major B.C. commerical salmonid fisheries (net and troll) for coded wire tagged salmonids and collecting the voluntary returns of sport caught marked fish. In addition, 330,532 chum and 2,807 pink salmon were sampled in selected net fisheries for multiple fin-clips.

COMMERCIAL SAMPLING

The goal of the MRP is to randomly sample a representative 20% of the chinook, coho, and steelhead caught in all fisheries throughout the season. Sampling effort was also directed at select fisheries anticipated to contain CWT chum. Computer modelling was used in determining the required sample sizes. Historic fishing patterns and catches, gear counts by military aircraft, and weekly production ledgers provided by industry representatives were used to estimate troll catches. DFO officers provided estimates of fleet size and preliminary catch information for the net fisheries.

Each of the seven major coastal sampling locations was chosen for its ability to supply catches for specific time periods and catch areas. Table 16 shows the various sampling locations and the fisheries each port was designated to sample. In past years, there has been a general trend to increased processing outside of the Vancouver area. This was not true in 1982. The increases noted for Vancouver and Steveston were due to both changes in delivery patterns and to an increase in the samples taken from the regions for which Vancouver is responsible.

Coastwide, troll sampling of ice/day boat catches was at a rate of 24% for coho and 25% for chinook. Net sampling was at rates of 27% and 30% for coho and chinook respectively. Only the limited Juan de Fuca troll fishery was not sampled for marks. This region is only open during net openings, has a small catch to which MRP has no direct access for sampling, and is not cost effective to sample. The seasonal sample rate for SWVN coho was low (chinook 26%, coho 15%) due to a cash buyer obtaining large numbers of coho during the terminal gillnet fishery in August. This buyer's delivery logistics did not permit MRP sampling.

Attempts are made to minimize the samples taken of catches originating from mixed catch regions, as recoveries from these areas cannot be expanded. Only three mixed regions were sampled in 1982 (C/NWTR, NW/SWTR, JSN/GSN). Of the 733 marks recovered, 91% were from NW/SWTR.

During 1982, 951,000 chinook, coho, and steelhead, and 292,000 chum were sampled. This compares to 746,000 chinook, coho, and steelehad, and 6700 chum in 1981. The increase in chinook, coho, and steelhead is a function of large incidental catches during a very large return of Fraser River sockeye. Chum sampling has increased over the years as chum marking has increased. A total of 20,726 adipose fin-clipped chinook, coho, and steelhead, and 278 chum were recovered.

Table 17 illustrates the mark incidence found in each catch region. It is interesting to note the decrease in the mark incidence of coho in the Georgia Strait area. Decreases were also noted in the number of coho recoveries from Georgia Strait sport fisheries. This decrease was not noted in the escapement to Capilano Hatchery and does not appear to relect a decrease in marking at the

hatchery.

VOLUNTARY SPORT RECOVERY PROGRAM

The Sport Recovery Program requests all sport anglers to check their catches for adipose clipped salmonids and to turn the heads from clipped fish into one of the 165 head depots located at marinas, tackle shops, and DFO offices along the coast. Advertisement of the program is through radio broadcasts of prize draws, posters, magazine ads, and the Tidal Waters Sport Fishing Guide.

For each head returned, the angler was asked to complete and attach a label giving catch information and the angler's name and address. South of Cape Caution the heads were collected on a regular basis by the sport sampler who transported them to the dissection laboratory. Other depots relied on MRP samplers (during the sampling season) and DFO officers to transport the heads.

During 1982, 8695 sport caught salmonid heads were recovered, a 17% decrease from 1981. Chinook recoveries (about 2700) showed a 25% increase from 1980 and 1981, even though the minimum legal size had increased from 30 cm to 45 cm. Coho recoveries (5700) declined in 1982, from about 8600 in 1981. Historically, relatively few steelhead recoveries have been made. In recent years, groups at the Fraser Valley Trout Hatchery and the Nanaimo BCFW have operated their own steelhead recovery programs, forwarding pertinent information to MRP. In 1982, however, some confusion arose among anglers, depot operators, fishery personnel, and MRP personnel regarding procedures to be followed. Steps were taken late in 1982 to establish consistent steelhead recovery procedures.

Participating sport anglers received newsletters, information on the origin of their marked fish, and a MRP button. Prizes totalling $6400 were won by participating anglers. The depots from which winning labels were issued won $1600 in prizes.

DISSECTION LABORATORY

The dissection laboratory operated successfully in 1982, providing a mean completion period of 26 days for processing commercial heads. This rate was possible because of reduced numbers of sport caught heads, improved field data quality, the absence of large numbers of coho in late-season fisheries, and staffing increases during periods of high recoveries. No-pin and lost-pin rates were within acceptable levels, although tags lost from chinook caught in troll fisheries were higher than expected (Table 18).

Commercially caught heads which did not appear to contain pins were x-rayed to confirm the reading of the field detector. Large sized chinook heads yielded a disproportionate number of tags. Heads greater than 14 cm made up 31% of the no-pin heads x-rayed, yet yielded 73% of the tags identified by x-ray.

Table 16. Sampling Locations

SAMPLING LOCATION	REGIONS SAMPLED	% OF TOTAL SAMPLING 1981	1982
Prince Rupert	NTR,CTR,NN,CN,AN	26%	21%
Namu	CTR,CN	9%	4%
Port Hardy	CTR,NWTR	4%	3%
Tofino/Ucluelet	NWTR,SWTR,SWVN	24%	20%
Steveston	CN,SWVN,JSN,GSN, NWVN,FGN,JFN	19%	24%
Vancouver	CTR,NWTR,SWTR,GSTR, CN,SWVN,JSN,FGN,JFN, GSN,NWVN	8%	29%
		100	100

Table 17. Mark Incidence for each Catch Region for the Salmonids Sampled

REGION	CHINOOK		COHO		STEELHEAD	
	1981	1982	1981	1982	1981	1982
NTR	1:32	1:47	1:530	1:995	1:53	none
CTR	1:38	1:39	1:53	1:65	1:7	1:32
NWTR	1:41	1:39	1:48	1:65	none	1:10
SWTR	1:35	1:48	1:30	1:32	none	none
GSTR	1:96	1:41	1:15	1:33	1:4	1:6
AN	1:44	1:12	1:445	none	none	none
NN	1:76	1:68	1:680	1:1060	1:279	1:960
CN	1:38	1:29	1:399	1:333	1:144	1:310
NWVN	1:39	1:37	1:849	1:330	1:3	1:2
SWVN	1:55	1:57	1:30	1:39	1:4	1:12
JFN	1:49	1:40	1:19	1:21	1:19	1:11
JSN	1:20	1:15	1:18	1:23	1:30	1:6
GSN	1:27	1:14	1:12	1:28	none	1:2
FGN	1:266	1:342	1:8	1:49	1:6	1:62

Table 18. The Percentage of Marked Fish Recovered Which Did not Yield Data

	COHO			CHINOOK		
	NET	TROLL	SPORT	NET	TROLL	SPORT
NO-PIN	11.1	14.6	11.4	8.5	11.9	8.9
LOST-PIN	3.2	3.5	3.7	3.5	4.7	3.8

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REFERENCES

COCHRAN, W.G. 1977. Sampling Techniques. J. Wiley & Sons. 3rd Edition. 428 pp.

DEPARTMENT OF FISHERIES & OCEANS, ECONOMICS & STATISTICS BRANCH. 1983. British Columbia Catch Statistics - 1982. Dept. of Fisheries & Oceans, Pacific Region. 238 pp.

JOHNSON, J.K. 1983. Pacific Salmonid Coded Wire Tag Releases Through 1982. Pacific Marine Fisheries Commission, Portland Oregon. 174 pp.

SEBER, G.A.F. 1981. The Estimation of Animal Abundance and Related Parameters. MacMillan Publ. Co., New York. 2nd Edition. 654 pp.